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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,791	02/06/2006	Luzhou Xu	CN02 0034 US	7166
65913	7550	09/23/2009		
NXP, B.V. NXP INTELLECTUAL PROPERTY & LICENSING M/S41-SJ 1109 MCKAY DRIVE SAN JOSE, CA 95131			EXAMINER BROOKS, SHANNON	
			ART UNIT 2617	PAPER NUMBER
			NOTIFICATION DATE 09/23/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

### Office Action Summary

**Application No.**

10/540,791

**Applicant(s)**

XU ET AL.

**Examiner**

SHANNON R. BROOKS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 17, 18, 33-37, 47 and 49 is/are rejected.
- 7) ☒ Claim(s) 2-16, 19-32, 38-46 and 48 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION*****Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1, 17, 18, 33, and 49** rejected under 35 U.S.C. 102(e) as being anticipated by Da Torre (US 2003/0027540 A1).

Consider **Claim 1**, Da Torre teaches a mobile terminal with multi-antenna based on CDMA [0023]-[0024]), comprising: a plurality of groups of radio frequency signal processing modules ([0025]-[0031] and Fig. 2), for transforming received multi-channel radio frequency signals based on CDMA to multi-channel baseband signals ([0025]-[0031]); a multi-antenna module, for combining said multi-channel baseband signals outputted from said plurality of groups of radio frequency signal processing modules into single-channel baseband signals according to control information received one-off when said multi-antenna module enables a multi-antenna baseband processing ([0025]-[0031]); and a baseband processing module, for providing said control information to said multi-antenna module and baseband processing said single-channel baseband signals outputted from said multi-antenna module ([0030]).

Consider **Claim 18**, Da Torre teaches a method for a mobile terminal with multi-antenna based on CDMA, comprising: (a) transforming received multi-channel radio frequency signals based on CDMA to multi-channel baseband signals ([0025]-[0031]); (b) combining said multi-channel baseband signals into single-channel baseband signals

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according to control information received one-off when a multi-antenna baseband processing is enabled ([0025]-[0031]); and (c) baseband processing said single-channel baseband signals ([0025]-[0031]).

Consider **Claim 49**, Da Torre teaches a mobile terminal, comprising: a transmitting means, for transmitting signals via an uplink (transmitter of Fig. 2); a receiving means, wherein the receiving means includes: a plurality of groups of radio frequency signal processing modules, for transforming received multi-channel radio frequency signals to multi-channel baseband signals ([0025]-[0031] and Fig. 2); a multi-antenna module, combining said multi-channel baseband signals outputted from the plurality of groups of radio frequency signal processing modules into single-channel baseband signals according to control information received one-off when said multi-antenna module enables a multi-antenna baseband processing ([0032]-[0050] and Fig. 3); and a baseband processing module, providing said control information to said multi-antenna module and baseband processing said single-channel baseband signals outputted from said multi-antenna module ([0032]-[0050] and Fig. 3).

Consider **Claim 17**, Da Torre teaches the mobile terminal of claim 1, wherein the terminal is applied to mobile terminals or other mobile wireless communication terminals, wireless LAN terminals employing one of following standards: WCDMA, IS95, CDMA2000 ([0022]-[0024]).

Consider **Claim 33**, Da Torre teaches the method of claim 18, wherein the method is applied to mobile terminals or other mobile wireless communication terminals, wireless LAN terminals employing one of following standards: WCDMA, IS95, CDMA2000

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([0022]-[0024]).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 34-37, and 47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Da Torre (US 2003/0027540 A1) in view of Sebastian (US 2003/0169720 A1).

Consider **Claim 34**, Da Torre teaches a multi-antenna processing device, comprising: a plurality of spatial filters, each of the plurality of spatial filters setting its working modes (controlled by the control parameter) according to received instruction, and processing multi-channel baseband signals according to received information related to spatial features of signals of each specific path to separate signals of said each specific path from

mixed signals ([0032]-[0050] and Fig. 3); a combiner, for combining signals outputted from each of said spatial filters according to received synchronization information (phase information, [00036]) and said instruction ([0032]-[0050]); except that it does not specifically teach a synchronization module, for providing said information related to spatial features of signals of each specific path to the plurality of spatial filters according to said instruction and said input multi-channel baseband signals, and providing said synchronization information to said combiner ; and a controller, for providing said instruction to said synchronization module, the plurality of spatial filters and said combiner according to received control information.

Da Torre teaches a module that provides phase information to provide to a combiner but does not specifically teach a synchronization module. However, Sebastian teaches a synchronization module (carrier recovery module, [0122], [0126], [0130]-[0131], and [0135]-[0136]) for providing said information related to spatial features of signals of each specific path to the plurality of spatial filters according to said instruction ([0136]) and said input multi-channel baseband signals, and providing said synchronization information to said combiner ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b) ; and a controller (controller in carrier recovery module, for controlling synchronization) for providing said instruction to said synchronization module, the plurality of spatial filters (separating the composite signals, [0136]) and said combiner according to received control information([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b).

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Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teachings of Sebastian into Da Torre to aid in the synchronization process ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b).

Consider **Claim 35**, Da Torre teaches the device of claim 34, wherein said controller includes a time alignment means, for time-aligning said signals outputted from each of the plurality of spatial filters(phase control, [0036]-[0050]).

Consider **Claim 36**, Da Torre teaches a multi-antenna processing device, comprising: a plurality of processing modules corresponding to a plurality of transmit antennas in a wireless communication system, receiving and processing signals from the plurality of transmit antennas, wherein each of said processing modules corresponding to transmit antennas is composed of a group of spatial filters (Fig. 3, item 314), and receives and processes signals from a specific transmit antenna, wherein said group of spatial filters includes a plurality of spatial filters, each setting its working mode according to received instruction (according to a control parameter) and processing multi-channel baseband signals according to received information related to spatial features of signals of each specific path to separate signals of each specific path mixed signals ([0032]-[0050] and Fig. 3); a combiner, for combining signals outputted from said each group of spatial filters according to received synchronization information and said instruction ([0032]-[0050]); except that it does not specifically teach a synchronization module, for providing said information related to spatial features of signals of each specific path ([0136]) to said each group of spatial filters in said each processing module corresponding to transmit antenna according to said instruction and said input multi-channel baseband signals, and providing said synchronization information related to signals transmitted by the plurality

of transmit antennas to said combiner ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b); and a controller, for providing said instruction to said synchronization module, the plurality of spatial filters (separating the composite signals, [0136]) in said each processing module corresponding to transmit antennas and said combiner according to received control information ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b).

Da Torre teaches a module that provides phase information to provide to a combiner but does not specifically teach a synchronization module. However, Sebastian teaches a synchronization module (carrier recovery module, [0122], [0126], [0130]-[0131], and [0135]-[0136]), for providing said information related to spatial features of signals of each specific path to said each group of spatial filters in said each processing module corresponding to transmit antenna according to said instruction and said input multi-channel baseband signals, and providing said synchronization information related to signals transmitted by the plurality of transmit antennas to said combiner ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b); and a controller, for providing said instruction to said synchronization module (controller in carrier recovery module, for controlling synchronization), the plurality of spatial filters in said each processing module corresponding to transmit antennas and said combiner according to received control information([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b) . Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teachings of Sebastian into Da Torre to aid in the synchronization process ([0122], [0126], [0130]-[0131], [0135]-[0136], and Figs. 11b and 12b).



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Consider **Claim 37**, Da Torre teaches the device of claim 36, wherein said combiner includes: a time alignment means, for time-aligning signals outputted from each of said spatial filters (combiner controller applying phase information to received antenna filters to improve performance, [0032]-[0050]).

Consider **Claim 47**, Sebastian teaches the device of claim 35, wherein said combiner includes: a plurality of delayers, delaying each of the output signals from the plurality of spatial filters to obtain synchronized signals under the control of the synchronization module ([0113] and Figs. 7C and 7D); and a combiner, for combining the synchronized signals delayed by said a plurality of delayers (Fig. 9B).

#### ***Allowable Subject Matter***

5. Claims 2-16, 19-32, 38-46, and 48 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to:**

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shannon Brooks whose telephone number is (571) 270-1115. The examiner can normally be reached on 7:30a.m. to 5p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nick Corsaro can be reached on (571) 272-7876. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

/Shannon R. Brooks/

Examiner, Art Unit 2617

Shannon Brooks

September 17, 2009

/NICK CORSARO/

Supervisory Patent Examiner, Art Unit 2617